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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,075	11/25/2003	Rangachary Mukundan	S-102,315	8636
35068 7590 10/09/2008 LOS ALAMOS NATIONAL SECURITY, LLC LOS ALAMOS NATIONAL LABORATORY P.O. BOX 1663, LC/TP, MS A187 LOS ALAMOS, NM 87545				
EXAMINER				
OLSEN, KAJ K				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
10/09/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/723,075

Applicant(s)

MUKUNDAN ET AL.

Examiner

KAJ K. OLSEN

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
3. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muller et al (USP 4,277,323) in view of Volkov et al (CAS abstract for SU patent 1247740 7-1986). Volkov is being cited and relied on for the first time with this office action.
4. Muller discloses a sensor comprising an electrolyte body 32 having a first electrolyte surface (i.e. the upper surface) with a reference electrode 30 depending therefrom, and another electrode body 31 having a first electrode surface coplanar with the first electrolyte surface. See fig. 2; col. 1, l. 64 - col. 2, l. 3; and col. 4, ll. 16-23. Muller does not explicitly disclose the use of a metal oxide for the electrode body but they did stress an embodiment where one of the two

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electrodes (30, 31) is made of a non-catalytic material (col. 5, ll. 7-13). Volkov teaches in an alternate oxygen sensor that materials such as $\text{La}_{1-x}\text{Sr}_x\text{CrO}_3$ find utility as non-catalytic electrodes. See the abstract. Because Muller stressed that one of its electrodes should be made non-catalytic and Volkov demonstrated that metal oxides already find utility in the art as non-catalytic electrodes for oxygen sensors, it would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Volkov for the sensor of Muller to yield the predictable result of having an oxygen sensor with the desired non-catalytic electrode. With respect to the sensor being a hydrocarbon sensor, that is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability. With respect to the electrolyte body being compressed and sintered about the metal oxide, the determination of patentability for the claim is based on the product itself. Because the product of the claim is identical to the invention of Muller and Volkov the process from which it was made is the same as or obvious over the process utilized by Muller and Volkov (see *In re Thorpe*, 777 F.2d 695, 698).

5. With respect to the particular choice of $x=0.2$ for the $\text{La}_{1-x}\text{Sr}_x\text{CrO}_3$ above, Volkov does not appear to stress any criticality to the choice of $x=0.3$ for its electrode composition. One possessing ordinary skill in the art would have been motivated to consider other compositions in the $\text{La}_{1-x}\text{Sr}_x\text{CrO}_3$ system, including the use of $x=0.2$, because varying the composition to get the preferred sensor performance requires only routine skill in the art.

6. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jakobs et al (Ionics, 2, 1996, pp. 451-458) in view of Muller. Jakobs is being cited and relied on for the first time with this office action.

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7. Jakobs discloses a hydrocarbon sensor comprising an electrode body having a first electrolyte surface (upper surface of fig. 3) with a Pt electrode depending therefrom. This platinum electrode reads on the defined "reference electrode" giving the claim terminology its broadest reasonable interpretation. Jakobs further discloses a metal oxide electrode body (perovskite powder electrode) on the electrolyte body. See section 2.2 on p. 453 and fig. 3 on p. 454. Jakobs does not explicitly disclose that the metal oxide electrode body is contained within the electrolyte body. Muller teaches that embedding the electrodes within the electrolyte body has the advantage of providing a gas sensor that has a low heat capacity and can be brought up to operating temperature more rapidly. See col. 1, l. 64 - col. 2, l. 28. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Muller and embed the metal oxide and reference electrodes into the electrolyte for the hydrocarbon sensor of Jakobs in order to arrive at a sensor that can be brought up to operating temperature more rapidly. With respect to the electrolyte body being compressed and sintered about the metal oxide, the determination of patentability for the claim is based on the product itself. Because the product of the claim is identical to the invention of Jakobs and Muller the process from which it was made is the same as or obvious over the process utilized by Jakobs and Muller (see *In re Thorpe*, 777 F.2d 695, 698).

8. With respect to the particular choice of $x=0.2$ for the $\text{La}_{1-x}\text{Sr}_x\text{CrO}_3$ above, Jakobs does not appear to stress any criticality to the choice of $x=0.1$ for its electrode composition. One possessing ordinary skill in the art would have been motivated to consider other compositions in the $\text{La}_{1-x}\text{Sr}_x\text{CrO}_3$ system, including the use of $x=0.2$, because varying the composition to get the preferred sensor performance requires only routine skill in the art.

9. Claim 4 rejected under 35 U.S.C. 103(a) as being unpatentable over Muller in view of Volkov or Jakobs in view of Muller as applied to claim 1 above, and further in view of Mase et al (US 4,755,274).
10. With respect to claim 4, Jakobs and Muller disclosed all the limitations and further specified the use of yttria stabilized zirconia (see Jakobs, section 3, p. 454). Jakobs and Muller did not explicitly suggest the use of zirconia having the specified porosity. Muller and Volkov disclosed all the limitations and further specified the use of stabilized zirconia (see Muller, col. 3, ll. 65-67). Muller and Volkov did not explicitly suggest the use of yttria stabilized zirconia having the specified porosity. Mase teaches a sensor comprising a yttria stabilized zirconia electrolyte body (108) (col. 9, ll. 53-56) with a desired porosity for gas diffusion and measurement produced by sintering (column 13, lines 6 - 13). It would have been obvious to one of ordinary skill in the art to stabilize the zirconia electrolyte body of Muller with yttria as taught by Mase and to produce a desired porosity of the electrolyte body of Muller and Volkov or Jakobs and Muller by sintering as taught by Mase because as Mase explains the porosity of the electrolyte body is selected according to the required level of diffusion resistance and is a parameter to be optimized (column 13, lines 1 -6).

Response to Arguments

11. Applicant's arguments filed 6/26/2008 have been fully considered but they are not persuasive. With respect to the rejection of Muller in view of Volkov, applicant challenges that "a hydrocarbon sensor" is only the intended use of the set forth structure as alleged by the examiner. In particular, applicant cites *Bicon, Inc. v. Straumann Co.*, 441 F3d 945 (Fed. Cir.

2006) as support for when the preamble is to further limit the scope of the claim. However, the examiner does not see how this cited case supports the applicant's position. The cited passage states that the preamble "is generally not treated as limiting the scope of the claim", but can be limiting "if it recites essential structure that is important to the invention or necessary to give meaning to the claim." Applicant's preamble sets forth no structural elements (let alone essential structural elements) and the body of the claim never refers back to anything in this preamble. Absent the presence of the cited exceptions above, applicant's preamble does constitute the intended use of the invention and should generally be treated as not limiting the scope of the claim as suggested by *Bicon, Inc. v. Straumann Co.*.

12. Applicant further urges that the structure of Muller would be unsuitable as a basis for a hydrocarbon sensor because of its use of a porous plate. However, this examiner is not urging that Muller be utilized as a hydrocarbon sensor in the rejection of Muller in view of Volkov because hydrocarbons are the intended use of the sensor. Both Muller and Volkov are drawn to oxygen sensors. Moreover, the claims do not read away from sensors utilizing a porous plate.

13. Applicant further urges that Muller does not have a reference electrode because neither electrode of Muller is set forth as being a reference electrode. However, in any two electrode electrochemical cell (as Muller is), one of the electrodes would read on the defined sensor electrode and one of the electrodes would be a reference electrode. That is, one of the electrodes would be at a potential referenced against the other electrode. Because Muller teaches applying a voltage across electrodes 30 and 31 of the sensor (fig. 1 and col. 3, ll. 55-63), the potential at electrode 31 is referenced against the potential at electrode 30 via said voltage applied across the

electrodes. Hence, electrode 30 reads on the defined reference electrode of the claims and this electrode is depending from the electrolyte (fig. 1).

14. Applicant further urges that it is unclear how the electrodes of Muller can be deposited onto the electrode while at the same time be contained within the electrolyte as required by the claims. First, applicant appears to have misconstrued Muller as Muller does not teach depositing the electrode onto the electrolyte, but rather depositing the electrolyte onto the electrodes. The electrodes are actually deposited onto the support 29, and not the electrolyte. See col. 4, ll. 16-23. Second, regardless of how Muller is constructed doesn't alter the fact that electrode 31 is contained within the electrolyte and has a surface (along element 29) that is coplanar. See fig. 2. The claims are drawn to an apparatus and the process of manufacturing said apparatus does not further define the apparatus itself.

15. With respect to the rejection of Jakobs in view of Muller, most of applicant's arguments appear to rely on the earlier perceived failings of the teaching of Muller. Because those earlier arguments were not persuasive (see above), these further arguments are similarly unpersuasive. Moreover, many of the arguments utilized against Muller in the Muller and Volkov rejection are not relevant to the use of Muller as a secondary teaching here.

16. Applicant further urges that "embedded" is not the same thing as "contained within." The examiner would concede that the two terms do not have identical scope, but would otherwise disagree with this conclusion by the applicant. The term "contained within" does overlap with the term "embedded" and that the term "contained within" would actually be broader than "embedded." Moreover, this argument is undercut by the similarities between the electrode and electrolyte arrangements of the present invention and Muller. In particular, the

present invention has a metal oxide body that is surrounded on all its sides, except for the top face that is left exposed (see fig. 1A and 1B). Muller discloses an electrode surrounded on all sides by electrolyte except for the top face that is left exposed (fig. 1 and 2). These similarities would indicate to one possessing ordinary skill in the art that the “embedded” of Muller clearly overlaps the “contained within” of the present invention.

Conclusion

17. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAJ K. OLSEN whose telephone number is (571)272-1344. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kaj K Olsen/
Primary Examiner, Art Unit 1795

October 10, 2008